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THE MANUAL ARTS

FOR PUBLIC SCHOOLS

WITH SPECIAL REFERENCE TO

ADAPTATION TO THE SMALLER SCHOOL SYSTEMS

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The Manual Arts for Public Schools.

"The Manual Arts" is a general term, which, although of comparatively recent origin, is being used quite generally to designate collectively the different lines of educational handwork as carried on in the schools of the United States. Under this heading are included the various lines of manual training, drawing, design and the household arts, domestic science and domestic art. Several names have been suggested from time to time as a general title for this prominent phase of modern school work, among them that of Industrial Art, but "The Manual Arts" has met with more general approval."

This movement toward unification of the handwork subjects, which have, until recently, been taught as entirely distinct branches in the curriculum, as suggested in the adoption of one general name for all, is in line with the tendency toward a closer correlation, and even unification of all of the subjects of the curriculum. There has been too much emphasis placed on the individual subjects and not enough on those things which are necessary to educate properly, regardless of what they are or under what name they commonly have been placed. To its credit it can be said that educational handwork in the schools has had considerable influence in bringing about a closer unification of all of the subjects in the curriculum.

The important thing to be accomplished is the education of the child—he must be prepared to live in an active, progressive world; not to live merely, but prepared to take an *active*, *intelligent* part in those affairs which make up his environment. As this fact is more fully realized the curriculum will not be spoken of as over-crowded with its many isolated, individual subjects. Dr. Frank McMurray says, that the essentials only in all subjects, regardless of what their names may be, should be taught. The essentials are necessary, and there is time for them in every curriculum.

The Manual Arts have a content value of sufficient weight to give them an important place in any complete educational scheme. In this great industrial age something of a knowledge of the realities of the industries is essential in "a culture appropriate to the life of the times." Emphasis may be given to the content value of the Arts, without in any way detracting from the mental training and discipline, the motor education, the opportunities which they offer for self-expression and the self-confidence and independence gained through them.

In the elementary school the general educational value of the Manual Arts is of first importance. Their practical value must have a second place here. Alhough many of the larger high schools are gradually giving more prominence to the Arts as vocational subjects, even here their general educational and cultural value can never entirely yield to their practical side. In this connection, Dr. Nicholas Murray Butler says: "The boy who has passed through the curriculum which includes Manual Training, will make a better carpenter, a better draughtsman, or a better metal worker than he who has not had the benefit of that training. But it is also true that he will make a better lawyer, a better physician, a better clergyman, a better teacher, a better merchant—should he elect any one of those honorable callings, and all for the same reason, namely: that he is a better equipped and more thoroughly educated man than his fellow in whose preparation Manual Training is not included."

On the other hand, emphasizing particularly the practical side, we have this excerpt from President Roosevelt's message to the last Congress: "It should be one of our prime objects as a nation, so far as feasible, constantly to work toward putting the mechanic, the wage-worker who works with his hands, on a higher plane of efficiency and reward, so as to increase his effectiveness in the economic world, and the dignity, the remuneration and the power of his position in the social world. Unfortunately, at present, the effect of some of the work in the public schools is in exactly the opposite direction. If boys and girls are trained merely in literary accomplishments, to the total exclusion of industrial, manual and technical training, the tendency is to unfit them for industrial work and to make them reluctant to go into it, or unfitted to do well if they do go into it. This is a tendency which should be strenuously combated. Our industrial development depends largely upon technical education, including in this term all industrial education, from that which fits a man to be a

good mechanic, a good carpenter, a good blacksmith, to that which fits a man to do the greatest engineering feat. The skilled mechanic, the skilled workman can best become such by technical-industrial education. In international rivalry this country does not have to fear the competition of pauper labor as much as it has to fear the educated labor of specially trained competitors; and we should have the education of the hand, eye and brain which will fit us to meet such competition."

The phenomenal results obtained in such Manual Training High Schools as those at St. Louis and Indianapolis, which have been in existence for a number of years, supplemented by those obtained in scores of other schools of the same high grade but of more recent establishment, fully justify their existence and rapid growth. Today practically every city of any size either has its separate Manual Training High School or is giving due prominence to the Manual Arts in its regular high schools.

While in these larger centers of secondary learning the results usually have been excellent, nevertheless in many instances the cost of carrying on the work there has been very great—often needlessly so. Their expensive equipments and cost of maintenance and of providing thoroughly trained teachers have had a discouraging effect on the school officials of many of the smaller cities, towns and villages, and the result has been that in many a field ripe for the work a beginning has not been made.

However, superintendents and principals, in rapidly increasing numbers, in these smaller school systems, are beginning to realize that large equipments and great expenditures of money are not essential to profitable work. They have started the work at little or no cost to school boards and good results have been obtained in many instances.

Until recently, in most of the school systems, the work in the Manual Arts has had its beginning in the high school, later been introduced in the upper grammar grades, and finally reached the primary grades. It is a satisfaction to note, however, that a change is gradually taking place and the primary school is being made the starting point. This is as it should be and is entirely consistent with the nature of the educational value of the Arts. A beginning in the lower grades where the cost is insignificant should later be followed, as conditions warrant, by work in the upper grades, and finally in the high school.

The schools of Ohio, in common with those of other states,

are rapidly awakening to the value of the Manual Arts in a well-balanced school course, and superintendents and principals are seeking the best methods of making educational handwork a vital part of their curricula.

The Ohio State Normal College of Miami University, standing for what it believes to be the best interests of the common schools of the state, has seen the demand for teachers prepared to teach the Manual Arts. Therefore it has established the department of Manual Arts. At present this department is giving a number of courses in drawing, design and manual training. As soon as possible it is the intention to furnish instruction in domestic science and domestic art.

The work of instruction in this department is along two general lines: First, to provide several courses in the Arts for all regular students in the Normal College, which they are required to take before receiving the State Diploma; secondly, to furnish a number of courses of sufficient intensity and broad enough in scope to prepare thoroughly special teachers and supervisors for these lines of work.

All regular students are required to take several courses in educational handwork; first, because this work is considered of sufficient general educational value to warrant a place in the preparation of every teacher; secondly, students thereby gain some knowledge of the subject matter and methods of a very important part of the present educational scheme; and thirdly, the students are thus prepared to teach the Arts under the direction of a supervisor or even to make a beginning in teaching them without this assistance.

Several two-year courses are given for the purpose of training special teachers and supervisors for Drawing and Manual Training in the public schools. These courses require the full time of the student for two years, and a Diploma is granted when a course is completed.

In addition, a number of courses are given during the Teachers' Special Term in the Spring and during the Summer Term, which afford opportunities for superintendents, principals and teachers to gain considerable knowledge of the different lines of the Manual Arts.

This department is especially interested in the problem of making the Manual Arts an important part of the curriculum in every village, town and small city school. If the Arts are essential to a complete education, the education of the boy and girl

who happen to be in a small school system, should include them as well as that of the pupil in the large city system. Large, well-equipped rooms and special teachers are often out of the question in the smaller schools. But considerable valuable handwork can be done with little equipment in the regular class room and by the regular grade teacher

The handwork in the primary grades should always be taught by the regular grade teachers. If they can work under the direction of a special teacher so much the better, but the regular teacher is the only person who can make the Arts have that vital relation to the rest of the curriculum that they should. In these grades no special room is necessary or even desirable. Simple equipments for the work may be kept in each room or one equipment may be moved easily from one room to another, as it is required, thereby materially reducing the cost of the work.

The materials which may be used in the handwork of the primary grades are many. But a few, wisely selected and dependent as to kind, largely on those with which the teacher is familiar and those capable of manipulation by the young children, are sufficient. Many natural materials, such as clay, grasses, bark, twigs, etc., are available and the pupils will be glad to collect them; also in the primary grades no set course of models is at all desirable. The handwork, closely related as it should be to the general work of the school, finds many points of contact with it. Correlation, for the sake of correlation, where there is no natural relation, is a waste; to force handwork into lessons where there is no occasion for it and where no good results will follow, is making it a mere fad. But the resourceful teacher will find many opportunities for making handwork so vital a factor in the teaching of number, nature study, history and reading, that the child will have a better understanding of them.

In the grammar grades and high school it is advisable to have a specially equipped room, and necessary to have a teacher who has had some special training in the Manual Arts. Where the services of a special teacher are not available because of lack of funds, the principal of the building, or one member of the teaching corps, may prepare himself to take charge of the classes in handwork by attending a good Summer School for one or more sessions.

Usually in every corps there is at least one teacher who has given some thought to Manual Training. In addition he has

some practical knowledge of tools and their use. Attendance at a Summer School where he may devote his entire time to the subject, gaining ideas as to the pedagogical aspect of the subject and the best methods to follow in order to make his work most effective, will enable him to make a beginning in his school.

If it is desired to provide separate work in the grammar grades and high school for the boys and girls, an arrangement similar to that made to provide instruction in Manual Training may be made with one of the women teachers to teach Domestic Art. The equipment for this subject is very inexpensive and no separate room is required. Very little satisfactory work in Domestic Science can be done without a special room and considerable equipment. The Drawing and Design require little equipment and no special room. (Of course, special rooms and large equipments are exceedingly helpful in all of these subjects, but they are not necessary to the accomplishment of some excellent results.) If possible, the Drawing and Design should be taught by the Manual Training or Domestic Art teacher, or both, in order that very close relations may be maintained between the subjects.

To provide separate handwork for the boys and girls in the upper grammar grades and high school is the custom, and no doubt is best if funds are available for the two equipments and separate teachers. Emphasis placed upon freehand drawing and the household arts in the education of the girls and similar emphasis upon mechanical drawing and tool work of various kinds for the boys is in keeping with the natural activities and inclinations of these two classes of students. But this differentiation of work is of more consequence when the practical side of the Manual Arts is considered. Manual Training has almost equal general educational value for boys and girls. Girls like to work with tools in wood and metal, many of them preferring such work to work in the household arts.

Freehand drawing, design, the making of working drawings and bench work in wood make an excellent course in the Manual Arts for both boys and girls in the grammar grades and first year of high school. Such a course is especially advised when separate equipments are not available. Later in the course for the girls some work in applied design in leather and sheet metal (not requiring much equipment) will come in to advantage to supplement the work in drawing.

The day is past when a man who has simply the education

necessary to make a good mechanic and who has not had the experience and professional training essential to make a good teacher, should be considered a suitable person to be put in charge of manual training classes. The qualifications necessary for the mechanic and the teacher, if combined, form an excellent foundation for special training in the methods of Manual Training. Often a successful teacher, having some experience in the use of tools, has made an excellent beginning in teaching Manual Training. But usually such an one has the foresight, before he advances very far with the work, to take some special training. Each line of educational handwork has a large content—subject matter which must be studied and thoroughly understood—and special methods of presentation which must be mastered before the greatest success is assured. Mere technical skill is not sufficient.

A "cut and dried" course of study is even of less value in the Manual Arts than in other subjects in the curriculum, because local conditions should have so much weight in shaping the handwork courses and school conditions change from year to year. A course good for one school may not be what is needed in another school; a course meeting the requirements one year may not do so in the same school another year.

Published courses of study worked out in all details have little value except as furnishing, possibly, some suggestive matter for the discriminating teacher. The only course which will meet the requirements of any school is one which has been planned by a teacher thoroughly familiar with local school and community conditions. Courses given in other schools should be consulted and used as suggestive material, but they should not be followed in any particular unless they meet local school conditions.

All work in construction should be preceded by a careful designing of the object to be made, after which, in most instances, a working drawing should be made. If properly carried out probably the results will not be exactly the same in the case of any two pupils, for each should put as much of himself into the work as possible. No project too difficult for him to do the work himself should be assigned a pupil; neither should it be so easy that he does not have to give it considerable careful thought.

In the introduction of Manual Training in the grammar grades and high school, of the smaller school systems especially, in addition to the problem of how to provide for the necessary in-

struction, a second problem is that of finding a suitable room. An unused basement room is found in almost every school building. Often with little or no expense this room can be put in condition for the work in Manual Training. The unused and often almost forgotten basement room has proved the salvation of Manual Training in many a school system. As plenty of light is necessary sometimes an extra window or two may have to be provided, or a cement floor may have to be laid. Care will have to be exercised in providing against dampness, or otherwise the tools will rust and the supply of lumber be kept in too damp a condition to be satisfactory for use.

After basement rooms (which are used for Manual Training purposes in hundreds of schools) the attic has often furnished a place for the work. It is very unfortunate that in planning school buildings architects have, in so many instances, failed to provide for a utilization of the entire building. Many large attics, dry and easily heated, would make excellent rooms for work in all lines of the Manual Arts if only the building plans had provided for windows. Fortunately, in some of these large spaces, windows may later be cut at comparatively small expense.

The matter of equipment next enters into the calculation of ways and means. Drawing, Design, Domestic Art, and some of the applied art in metal, leather, etc., may be done with excellent results with little expense for equipment. Some profitable work in Domestic Science may be done with an equipment consisting of several kitchen tables, a cooking stove and a few dishes. But a more complete equipment is desirable.

As bench work in wood usually occupies the most prominent place in work in the Manual Arts, and as the equipment for this work is often found to be quite expensive, it is the cost of equipment for this work that most school authorities are particularly interested in. The equipment for this work may be very elaborate and complete and therefore quite expensive. But good work is being done in many schools on benches made by the teacher and the pupils, and with a few tools secured by means of entertainments, or brought from home by the pupils. In other schools the board has given only fifty to one hundred dollars, and a beginning has been made.

If enough equipment can be secured to make a start, the pupils will become so interested in the work, and through them the parents, that the board will usually find a way to add to the original equipment. Estimates for several equipments are given

below in the hope that they will be helpful in two ways to school authorities wishing to start work in Manual Training. First, the less expensive equipments show what can be done for a very small amount of money; secondly, the proper tools and good makes of the same are listed in the different equipments suggested, showing what can be done with different expenditures. Even if only a few dollars are available it is better to buy a few good tools than a greater number of poor ones. Good tools are always good and the equipment can be added to from time to time; poor tools will not do good work even when they are new, and they will have to be thrown away soon.

$50 Equipment for 12 or More Pupils.

2 benches, 3 ft. wide and 10 to 12 ft. long, made by instructor and students; material used, yellow pine, 2 in. thick; 12 iron bench screws for vises for above benches.

6 Bailey adjustable iron jack planes, 14 in.; 2 Bailey adjustable iron block planes, 6 in.; 6 Bishop back saws, 10-inch. blades; 6 Buck Bros. ¾ in. firmer chisels; 6 chisels ¼ in.; 6 rosewood handled try squares, 6 in.; 6 beechwood marking gauges; 4 Bailey iron spoke shaves: 3 brad awls; 1 varnish brush; 12 swedish sloyd knives; 6 Hammond bell face claw hammers; 3 champion pattern screw drivers, 3-in blade; 4 wing dividers, 6-in.; 4 half round cabinet files, 8-inch; 1 Bishop No. 7 20-in. cross cut saw and 1 same grade rip saw; 2 coping saws with 2 doz. blades; 1 sliding T bevel; 2 Buck Bros. firmer gouges, 1-in., outside bevel; 2 plain braces, 8-in. sweep; 1 set gimlet bits, 4-32 to 8-32; 3 Russell Jennings auger bits, 1 each of ⅜, ½ and ⅝ in.; 1 rose countersink; 2 Pratt's knurled nail sets; 6 wood hand screws, 7 ¼ in opening; 1 oil stone and oil can.

$100 Equipment For 10 to 20 Pupils.

10 single manual training benches, each provided with 2 wooden vises (these benches can be purchased at about $6 each, complete). The tools as listed under "$50 Equipment" with the addition of 4 Bailey adjustable iron jack planes.

$200 Equipment For 12 to 24 Pupils.

12 single manual training benches with 2 wooden vises ($6 each complete); 12 Bailey adjustable iron jack planes, 14-in.; 6 Bailey adjustable iron block planes 6 in.; 12 Bishop back saws, 10-inch blades; 24 Buck Bros. chisels, 12 ¾ in., 6 ¼ in., 3 ⅜ in., 3 ⅝ in.; 12 rosewood handled try squares, 7½ in.; 12 maple 1-foot

rules; 12 beechwood marking gauges; 12 iron spoke shaves; 12 hickory mallets; 12 sloyd knives; 12 Hammond bell face claw hammers, 13 oz; 12 champion pattern screw drivers, 4-in. blades; 12 wing dividers, 6-in.; 12 half round cabinet files, 8-in.; 1 foot power grindstone; 3 Bishop cross cut saws, No. 90, 20-in.; 3 rip saws of same grade; 1 steel framing square; 1 new Langdon mitre box improved; 2 14-in. turning saws; 6 coping saws, 4-in. deep, and 6 doz. blades; 4 sliding T bevels, 6-in; 4 Buck Bros. firmer gouges, 1-in., outside beveled; 4 plain Barber braces, 8-in. sweep; 1 set Russell–Jennings auger bits; 1 set German gimlet bits; 2 Rose countersinks; 2 Buck Bros. screw driver bits; 4 cup point knurled nail sets: 4 brad awls; 12 wood hand screws, 8½-in. opening; 1 kerosene glue heater and brush; 2 India oil stones in cases; 2 oil slips; 1 oil can; 2 straight cabinet scrapers; 2 swan neck scrapers; 2 varnish brushes; 12 bench brushes; 2 whisk brooms; 24 drawing boards, pine, 12-in. x 17-inch.; 24 wooden T squares; 12 45° wooden triangles, 6-in.; 12 30-60° wooden triangles, 8 in.; 24 excelsior pencil compasses.

$300 Equipment For 18 to 24 Pupils.

Reduce "$400 Equipment" (which follows) by the following substractions:

6 manual training benches; 6 jack planes; 12 block planes; 6 1-in. chisels; 6 ¼-in. chisels; 6 try squares; 6 rules; 6 marking guages, 12 spoke shaves; change 24 lignumvitae mallets to 12 hickory mallets; 6 hammers; 12 screw drivers; 6 wing dividers; 12 cabinet files; 1 Landon mitre box; 1 beading, etc., plane; 1 set auger bits; 12 8½-inch. wooden hand screws; 6 12-in. hand screws; 6 bench brushes.

$400 Equipment For 24 Pupils.

24 single manual training benches, each provided with two wood vises; 24 Bailey adjustable iron jack planes, 14-in; 24 Bailey adjustable iron block planes, 6-in.; 24 Bishop back saws, No. 8, 12-in. blade; 24 Buck Bros. 1-in. firmer chisels; 24 Buck Bros. ¼ in. firmer chisels; 24 iron handled try squares, 8-in.; 24 two feet, two fold rules, circle joint bound; 24 boxwood marking gauges; 24 Bailey iron spoke shaves; 24 lignumvitae mallets; 24 sloyd knives; 24 Hammond bell face claw hammers, 13 oz.; 24 champion pattern screw drivers, 4-in. blade; 24 wing dividers, 6-in., 24 half round cabinet files, 8-in.; 1 foot power grindstone; 4 Bishop cross cut saws, No. 90, 20-in.; 4 Bishop rip saws, No. 90, 20-in.; 2

steel framing squares; 1 new Langdon mitre box improved, No. 28; 4 14-in. turning saws; 1 glass cutter; 6 coping saws, 4-in deep, and 6 doz. blades; 2 coping saws, 8 in. deep, and 2 doz. blades; 1 Stanley adjustable beading, rabbet and matching plane; 6 eureka flush bevels, 6-in.; 2 each of ⅛, ⅜, ½, ⅝, ¾ and ⅞ in. Buck Bros. firmer chisels; 6 each of ½ and 1-in. Buck Bros. firmer gouges, outside beveled; 1 set Buck Bros. carving tools, 12 tools; 6 Buck Bros. carving tools. No. 11, ⅛-in.; 4 Barber improved plain braces, 8-in. sweep; 1 Barber improved ratchet brace, 10-in. sweep; 2 sets Russell Jennings auger bits; 1 Clark's pattern expansion bit No. 2; 1 set Pratt's German pattern gimlet bits; 3 Rose countersinks; 2 Buck Bros. screw driver bits; 6 Pratt's knurled cup point nail sets: 6 brad awls handled; 1 Nicholson file card and brush; 1 plain inside caliper, 6-in; 1 plain outside caliper, 6-in; 1 Buck Bros. draw knife, 10-in. blade; 3 whisk brooms; 24 wood hand screws, 8 ½-in. opening; 12 wood hand screws, 12-inch opening; 1 kerosene glue heater, 1 qt., capacity, and brush; 1 India oil stone in iron case, 8x2x1 medium; 1 oil stone, same size, fine; 4 assorted India oil slips; 2 oil cans, "copperized"; 2 straight cabinet scrapers; 2 swan neck scrapers; 5 1-in varnish brushes; 24 bench brushes; 24 drawing boards, white pine, 12x17-in.; 24 wooden T squares; 12 45° wooden triangles, 6-in.; 12 30°-60° wooden triangles, 8-in.; 24 excelsior pencil compasses.

$500 Equipment For 24 Pupils.

In the "$400 Equipment," if either a Toles or Abernathy rapid acting iron vise be placed on the front of each bench instead of the regular wooden vise the cost of the equipment will approximate $500.

The more complete of the above equipments provide for simple work in mechanical Drawing as well as Woodwork. Good working drawings can be made with the rather inexpensive drawing tools listed above. Advanced work would require in addition a set of instruments for each student. A set entirely satisfactory for high school use may be purchased for $2. But the use of such instrumeuts as those listed in the equipments above is advised for work below the high school.

The cost of material for the different lines of work in the Manual Arts is a very variable quantity in different schools. The handwork in the first four grades need not cost more than ten cents per pupil per year and even less if considerable natural

material is used. Often most of the material for the work in these grades is brought by the pupils at no expense to the school.

The material for Drawing and Domestic Art throughout all of the grades is very inexpensive and is often furnished by the pupils. Little good work can be done in Domestic Science where each student does individual laboratory work at a less cost than from two to five cents per pupil per lesson. The cost of bench work in wood ranges in different schools from 25 cents to 50 cents per capita per year. For the lower grammar grades the smaller figure is sufficient, while for the eighth grade and high school probably 40 to 50 cents will be found necessary. However, even in this work, the pupils will willingly bring boxes and other wood from home to supplement the supply at school, thereby reducing the cost of maintenance.

Another phase of the Manual Arts problem which is receiving considerable attention at the Normal College, is "what can be done in the rural schools?" Certainly considerable can be done in the consolidated school or in a school where there are several teachers. But in the one-room school with one teacher who has his hands more than full with the business of hearing twenty to thirty recitations each day the question is a more serious one. But the day is rapidly approaching when it will be seen that there are essentials and non-essentials in the present curriculum of the rural school. A need will be felt for the Manual Arts and Elementary Agriculture (which are closely related in their aims and methods) and they will be considered necessary in the education of the rural boy and girl.

But under present conditions probably most of the handwork will have to be done at odd moments during the day—before and after regular school hours, at recess periods, etc. The work may profitably be of a very practical nature. The boys can make many articles of use in and about the school building, small pieces of furniture for their homes and learn to do many jobs of repairing about the house and farm. Instruction in the Household Arts will at all times be of practical use to the girls.

One of the rural schools near Oxford has been selected as an observation school for those taking the Township Teachers' Course. A small equipment for wood-working has been placed in this school. (This equipment is given below). The teacher of this school, with other township teachers, has been taking work in Manual Training on Saturdays at the Normal College.

Great enthusiasm for this work is being manifested at these schools. Later it is the intention to make a report of the work done there.

EQUIPMENT COSTING $32.

2 single Manual Training benches, with two wooden vises on each; 2 14-in. Bailey adjustable iron jack planes; 2 iron block planes; 2 20-in. Bishop cross-cut saws; 2 20-in. Bishop rip saws; 2 10-inch Bishop back saws; 2 coping saws and 2 doz. blades; 2 8-in. iron try squares; 2 beechwood marking gauges; 2 iron spoke shaves, 2 Buck Bros.' 1-in. firmer chisels; 2 Buck Bros.' 1-4-in. firmer chisels; 2 Sloyd knives; 2 Spoffard braces; 2 claw hammers; 2 1-2-in. Jennings Auger bits; 1 set of German gimlet bits; 2 4-in. screw drivers; 2 Rose countersinks; 2 nail sets; 2 8-in. half-round cabinet files; 2 6-in winged dividers.

In addition to the work of instruction along the several lines indicated above, the department of Manual Arts stands ready to be of what assistance it may to school officials who are contemplating putting educational handwork in their schools, or who wish to make work already started more efficient.

Detailed information regarding courses of study in the Manual Arts is found in the catalogue of Miami University for 1906-7. Also courses given during the Teachers' Special Term, May 16 to Aug.2, and Summer Term, June 25 to Aug. 2, 1907, are explained in the Special Summer Term Announcement. The Catalogue and Summer Term Announcement will be sent on application to DEAN H. C. MINNICH, of the State Normal College of Miami University.

FRED C. WHITCOMB.

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